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MS APPEAL BRIEF - PATENTS
PATENT
0033-0619P

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of		Before the Board of Appeals	
Hiroya SATO et al.		Appeal No.:	
Appl. No.:	09/400,974	Group:	2685
Filed:	September 22, 1999	Examiner:	L. LE
Conf.:	4024		
For:	MILLIMETER BAND SIGNAL TRANSMITTING/RECEIVING SYSTEM HAVING FUNCTION OF TRANSMITTING/RECEIVING MILLIMETER BAND SIGNAL AND HOUSE PROVIDED WITH THE SAME		

APPEAL BRIEF TRANSMITTAL FORM

MS APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 7, 2004

Sir:

Transmitted herewith is an Appeal Brief (in triplicate) on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on March 8, 2004.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27

The fee has been calculated as shown below:

☒ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $110.00.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

Reg. # 57,377

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RWD
CG/RWD/lab
0033-0619P

Attachment(s)

(Rev. 02/08/2004)

1 of 3

#23
6/22/04
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PATENT
0033-0619P

IN THE U.S. PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF

BEFORE THE BOARD OF APPEALS

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For: MILLIMETER BAND SIGNAL TRANSMITTING/RECEIVING SYSTEM HAVING FUNCTION OF TRANSMITTING/RECEIVING MILLIMETER BAND SIGNAL AND HOUSE PROVIDED WITH THE SAME

APPEAL BRIEF

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For: MILLIMETER BAND SIGNAL TRANSMITTING/RECEIVING SYSTEM HAVING FUNCTION OF TRANSMITTING/RECEIVING MILLIMETER BAND SIGNAL AND HOUSE PROVIDED WITH THE SAME

APPEAL BRIEF ON BEHALF OF APPELLANTS:
Hiroya SATO et al.

Assistant Commissioner for Patents
Washington, D.C. 20231

June 7, 2004

Sir:

I. REAL PARTY IN INTEREST

The real party in interest for this application is the Assignee, SHARP KABUSHIKI KAISHA, of 22-22 Nagaike-cho, Abeno-ku, Osaka 545-8522, Japan.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences pending with respect to the subject matter of the present application.

III. STATUS OF CLAIMS

Claims 1-40 remain pending. Claims 1, 11, 15 and 18 are independent. No claims have been allowed.

IV. STATUS OF AMENDMENTS

An amendment was filed February 6, 2004 that included only remarks. That amendment has been entered based on the Advisory Action of May 5, 2004. Also, the May 5, 2004 Advisory Action withdraws the rejections under 35 U.S.C. § 112.

V. SUMMARY OF THE INVENTION

In a preferred embodiment, the present application relates to a millimeter band signal transmitter transmitting/receiving system, and a house provided with the same, and more specifically to a millimeter band signal transmitting/receiving system for indoor transmission of a video signal using a millimeter wave, and a house provided with the same (e.g., see Figure 1).

Conventional wireless LAN systems offer at least two benefits. They alleviate the need for fixed wiring, for example, throughout a house, and they enable portability to a certain extent. In order to enable such flexibility in placement or movement of the transmit side device and receive side device, omnidirectional antennas are used. A problem with wireless LAN systems for

use in transmitting video signals, however, has been that when two waves are simultaneously received over multiple paths, a ghosting effect occurs (page 8, lines 24-28).

In the present invention, the receiver simultaneously receives each of the indirect and direct path signal waves when the direct path to the receive antenna is unobstructed. If the direct line of site path between the transmitter and receiver is blocked, the receiver only receives one or more of the indirect path signal waves, thus ensuring that good transmission/reception are still achieved (page 9, lines 12-15). Simultaneous reception is insured because both the transmitter and receiver antennas are directional. In a preferred embodiment, a transmitter transmits one or more indirect signal waves from the main-lobe or the side lobe of a transmit antenna, and a direct path signal wave between the transmit antenna and the receive antenna is transmitted in a side-lobe of the transmit antenna (page 9, lines 5-8). The receive antenna receives the indirect path signal and the direct path signal at its corresponding mail lobe and side lobe, respectively.

In a further preferred embodiment (e.g., see Figure 3), the indirect path signal wave is propagated from the transmitter through the transmit antenna, and is reflected from a reflector which may be a part of the structure of a house or building.

In all embodiments of the present application, a single receiver and a single receive antenna are preferred. Other embodiments of the present application use one or more transmitters and associated transmit antennae to

ensure that good communication is maintained, even when the direct path between a transmit antenna and a receiver is blocked.

VI. THE GROUNDS OF REJECTION

The Examiner has rejected all pending claims as follows:

Claims 1-11, 14-23, 28-40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortune et al. (U.S. Patent 5,450,615, hereinafter Fortune) in view of Hayashikura et al. (U.S. Patent 5,654,715, hereinafter Hayashikura).

Claims 12, 13, 24-26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortune, Hayashikura, Kagami et al. (U.S. Patent 5,479,443, hereinafter "Kagami").

Claim 27 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura, as applied to claim 18, in view of Evans et al. (U.S. Patent 5,920,813, hereinafter Evans).

VII. ISSUES ON APPEAL

The issues to be resolved in this appeal are whether claims 1-11, 14-23, 28-40 are unpatentable under 35 U.S.C. § 103(a), whether claims 12, 13, 24-26 are unpatentable under 35 U.S.C. § 103(a), and whether claim 27 is unpatentable under 35 U.S.C. § 103(a).

VIII. GROUPING OF CLAIMS

The claims should be grouped as follows for purposes of this Appeal:

(1) Claims 1, 8-11, 14, 15 and 33-37 stand or fall together;

(2) Claims 18, 23, 24, 30, 31 and 32 stand or fall together;

(3) Claims 12 and 13 stand or fall together;

(4) Claims 25 and 26 stand or fall together;

(5) Claims 2-7, 16 and 17 stand or fall together;

(6) Claims 19-22 stand or fall together;

(7) Claim 38-40 stand or fall together;

(8) Claims 28 and 29 stand or fall together; and

(9) Claim 27 is separately grouped and argued.

IX. ARGUMENT

A. Rejection of claims 1, 8, 9, 10, 11, 14, 15, and 33-37 under 35 U.S.C. 103(a)

1. Argument Summary

The reasoning provided in support of the rejection of claims 1, 8, 9, 10, 11, 14, 15, and 33-37 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiencies of the rejection are that Fortune and Hayashikura, either alone or in combination, fail to show or suggest all claim limitations, the rejection does not treat the obviousness of the claim as a whole, and insufficient evidence is provided to show that missing limitations are necessarily present in the references.

Appellants note that thought the issue of inherency was not presented in the Office Action, because at least one element was not shown by either of the references, Appellants have addressed the prior art rejections considering inherency.

2. The Legal Requirements of Prima Facie Obviousness

To establish prima facie obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of the prior art must be supported by some teaching, suggestion, or motivation in the applied references or in knowledge generally available to one skilled in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a prima facie case of obviousness. In re Brouwer, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. In re Hedges, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); In re Ehrreich, 590 F.2d 902, 908-909, 200 USPQ 504, 510 (C.C.P.A. 1979).

Furthermore, when considering the differences between the primary reference and the claimed invention, the question for assessing obviousness is not whether the differences themselves would be been obvious, but instead whether the claimed invention as a whole would have been obvious. Stratoflex Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

3. The Legal Requirements for Inherency

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the alleged inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Once a reference teaching a product appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence or reasoning tending to show inherency, the burden shifts to the applicant to show an unobvious difference. "The PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on 'prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same." In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980).

4. <u>The rejection fails to establish prima facie obviousness of claims 1, 8-11, 14, 15, and 33-37</u>

Claim 1, and similarly claims 8-11, 14, 15 and 33-37, is directed to a millimeter band signal transmitting/receiving system comprising a stationary transmitter transmitting a millimeter band signal wave, a propagation path forming portion forming at least one indirect propagation path for propagation of said millimeter band signal wave, and a stationary receiver including a receive antenna having a main lobe and a side lobe capable of simultaneously receiving a plurality of said millimeter band signal waves from a plurality of propagation paths including a line of sight propagation path to said transmitter and said at least one indirect propagation path, and receiving said millimeter band signal wave from at least one of said plurality of propagation paths.

The final Office Action states that Fortune's transmit antenna 211 teaches the claimed stationary transmitter, reflection path 219 teaches the claimed indirect propagation path, receive antenna 215 teaches the claimed stationary receiver including a receive antenna, and direct path 217 teaches the claimed line of sight propagation path. The final Office Action admits that Fortune does not specifically disclose a receive antenna having a main lobe and a side lobe.

Instead, the final Office Action appears to indicate that a receive antenna having a main lobe and a side lobe would have been an obvious variation of the receive antenna 215 in Fortune. In particular, the final Office Action states that Fortune's receive antenna "is intended to receive the direct and indirect paths and to ensure antenna gains ... as disclosed by Fortune's calculated reflection

path losses and direct path losses being scaled based on the antenna power gain in the direction of propagation" and directs Appellants attention to column 6, lines 52-56, of Fortune (Note that the actual statement in page 4 of the final Office Action - last sentence in the paragraph of that page, is somewhat confusing, as it cites Appellants' own specification in support of obviousness). The Advisory Action of March 1, 2004 further addresses this rejection by directing Appellants attention to a section at column 9, line 29, to column 10, line 21 (Note that Appellants only found a further teaching of the same half-wave dipole in this section and were unsure what point the Examiner was trying to make in the Advisory Action's comments).

At the outset, there are some fundamental differences between the wireless communications system used as an example in Fortune and the transmitting/receiving system of the present invention. It appears from the Advisory Action, at least, that there may be a belief that the half-wave dipole antenna assumed in Fortune is an antenna having a main lobe and a side lobe. It is well known in the antenna art, however, that a half-wave dipole antenna is an omni directional antenna (i.e., receives/transmits signals from/in all directions; a definition can be found in any standard electronics dictionary). It is referred to as a "dipole" because it has two straight collinear conductors of equal length, each conductor at a quarter-wave length long. A reason that such an antenna would be used in a wireless system is for flexibility in arrangement of the transmit antenna relative to the receive antenna; standard practice is to

provide a system whose components can be used from any location within a certain range (an advantage of wireless systems over wired systems).

The present invention, on the other hand, uses a directional type antenna. By definition, a main lobe is the part of the directional antenna that transmits/receives the main beam; i.e., the radiation lobe containing the direction of maximum radiation. A side lobe, also part of a directional antenna, is a lobe other than the main lobe which generally transmits/receives a signal at a ratio of amplitude from the main lobe. Thus, the wireless communications system disclosed in Fortune uses an omni directional antenna for both the transmit and receive antennas, whereas the transmitting/receiving system of the present invention uses directional antennas, each having at least a main lobe and a side lobe.

A reason that a directional type antenna is used in the present invention is because of the aspect of transmitting and receiving signal waves of the millimeter band indoors. These waves are at such a high frequency that they are typically transmitted and received in a line of sight using directional antennas. In the present invention, Appellants have determined that by transmitting a reflected signal wave using a main lobe and a line of sight signal wave using a side lobe that the receiver can be arranged to receive the propagated signals simultaneously. Because the present invention is for transmitting video signals, it is important to be able to receive the duplicate signals simultaneously in order to avoid a ghosting effect which generally occurs when conventional wireless systems are used for such applications (see

specification at page 8, lines 19-28). Ghosting occurs when a receiver receives the same transmitted signal at different times or when it receives different transmitted signals at the same time.

Also, the side lobe of the present transmit antenna transmits the millimeter band signal wave in a line of sight direction and the main lobe transmits the millimeter signal wave in a direction such that it follows a reflected propagation path. Thus, the present invention makes use of reflection in order to obtain a redundant propagation path such that at least one propagated wave reaches the receiver. Fortune's technique takes into consideration reflection losses in determining total receiver power, however, the technique does not require simultaneously receiving a plurality of signal waves from a plurality of propagation paths including an indirect propagation path. In other words, Fortune does not consider reliability, per se, via redundant propagation paths. Thus it is clear that Fortune does not anticipate the present invention.

The rejection admits that Fortune doesn't teach transmission of a millimeter band signal. Instead, the rejection relies on the teachings of Hayashikura. As a reason for combining the references, the rejection states that, "It would have been obvious to one of ordinary skill in the art at the time the invention was made to comprise the indoor, in-building high frequency signal of Fortune et al with the millimeter band signal in order to fully utilize the continuous spectrum by broadening the intended use of the signal wave for commercial purposes merely by using an alternative frequency in a higher

frequency band than usual depending on the available spectrum resource of the system." In other words, it appears that the rejection is stating that the millimeter band is merely an alternative frequency band. Appellants disagree.

Millimeter band frequencies suffer from a problem that if a path between a transmitter and receiver is obstructed by an object, propagation of a direct wave is interrupted as the wave is absorbed by the object (specification at page 1, first paragraph under "Description of the Background Art"). Thus, systems based on millimeter band have not been practical for indoor applications (specification at page 1, second paragraph under "Description of the Background Art").

Hayashikura is directed to a vehicle-based system and thus does not address problems with in-door use. Because, of the inherent problems of using millimeter band signals in-doors, Appellants submit that use of a millimeter band signal in the system of Fortune would not just be a matter of using a signal of a higher frequency.

Also, Hayashikura does not disclose a plurality of propagation paths for a millimeter band signal, nor a receive antenna having a main lobe and a side lobe. Thus, Appellants submit that Hayashikura fails to make up for the deficiencies in Fortune.

Thus, Fortune and Hayashikura, either alone or in combination, fail to teach or suggest all claim limitations of claims 1, 8-11, 14, 15, and 33-37.

The rejection treats the missing element itself as being obvious rather than the claimed invention as a whole. The rejection directs Appellants

attention to a section at column 6, lines 52-56 of Fortune as teaching, as an obvious variation, a receive antenna having a main lobe and a side lobe. That section discloses that calculations using Fortune's technique can be made for other types of antennas (e.g., see column 6, lines 52-56, which states that, "Note that reflection path losses and direct path losses can be scaled for different types of antennas simply by multiplying the total calculation path loss by the antenna power gain in the direction of interest."). Appellants submit that substituting the directional antenna of the present invention into the conventional wireless communications system of Fortune would not just be a matter of adjusting a power gain. Other factors would have to be taken into account. For example, substituting a directional antenna of the present invention for the assumed half-wave dipole of Fortune would restrict the communications system to stationary communications devices instead of portable devices. There is no evidence in Fortune that would teach use of its technique to take into consideration such a constraint.

Thus, Appellants submit that the transmitting/receiving system of the present claimed invention is not suggested by Fortune or Hayashikura, either alone or in combination.

Appellants submit that there is insufficient evidence to support that a receive antenna having a main lobe and a side lobe is necessarily present in Fortune. As noted above, Fortune merely discloses a half-wave dipole antenna as the antenna assumed in explaining its technique. Fortune states that its technique could be performed assuming other types of antennas (at column 6,

lines 52-56). Hayashikura discloses a receiving antenna for picking up a reflected wave from an object. However, there is no evidence that would suggest a receive antenna having both a main lobe and a side lobe in order to enable reception of a signal through propagation paths except the line of sight propagation path at one of the lobes as well as through the line of sight propagation path.

For at least the above reasons, Appellants submit that the rejection fails to establish prima facie obviousness for claims 1, 8-11, 14, 15 and 33-37. Accordingly, Appellants respectfully request that the rejection be withdrawn.

B. Rejection of claims 18, 23, 24, 30, 31, and 32 under 35 U.S.C. 103(a)

1. <u>Argument Summary</u>

The reasoning provided in support of the rejection of claims 18, 23, 24, 30, 31, and 32 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiencies of the rejection are that Fortune and Hayashikura, either alone or in combination, fail to show or suggest all claim limitations, the rejection does not treat the obviousness of the claim as a whole, and insufficient evidence is provided to show that missing limitations are necessarily present in the references.

2. <u>The rejection fails to establish prima facie obviousness of claim 18, 23, 24, 30, 31, 32</u>

Claim 18, and similarly claims 23, 24, 30, 31 and 32, is directed to a millimeter band signal transmitting/receiving system comprising a stationary transmitter transmitting a millimeter band signal through an associated transmit antenna along a plurality of propagation paths including a line of sight propagation path, and a stationary receiver receiving the millimeter band signal through a receive antenna having a main lobe and a side lobe. The claim also recites a normal state and an obstructed state for the receiver.

The final Office Action states that Fortune's transmit antenna 211 teaches the claimed stationary transmitter, reflection path 219 teaches the claimed indirect propagation path, receive antenna 215 teaches the claimed stationary receiver including a receive antenna, and direct path 217 teaches the claimed line of sight propagation path. The final Office Action admits that Fortune does not specifically disclose a receive antenna having a main lobe and a side lobe.

Instead, the final Office Action appears to indicate that a receive antenna having a main lobe and a side lobe would have been an obvious variation of the receive antenna 215 in Fortune. In particular, the final Office Action states that Fortune's receive antenna "is intended to receive the direct and indirect paths and to ensure antenna gains ... as disclosed by Fortune's calculated reflection path losses and direct path losses being scaled based on the antenna power gain in the direction of propagation" and directs Appellants attention to column 6, lines 52-56, of Fortune (Note that the actual statement in page 4 of the final Office Action - last sentence in the paragraph of that page, is somewhat

confusing, as it cites Appellants' own specification in support of obviousness). The Advisory Action of March 1, 2004 further addresses this rejection by directing Appellants attention to a section at column 9, line 29, to column 10, line 21 (Note that Appellants only found a further teaching of the same half-wave dipole in this section and were unsure what point the Examiner was trying to make in the Advisory Action's comments).

At the outset, there is are some fundamental differences between the wireless communications system used as an example in Fortune and the transmitting/receiving system of the present invention. It appears from the Advisory Action, at least, that there may be a belief that the half-wave dipole antenna assumed in Fortune is an antenna having a main lobe and a side lobe. It is well known in the antenna art, however, that a half-wave dipole antenna is an omni directional antenna (i.e., receives/transmits signals from/in all directions; a definition can be found in any standard electronics dictionary). It is referred to as a "dipole" because it has two straight collinear conductors of equal length, each conductor at a quarter-wave length long. A reason that such an antenna would be used in a wireless system is for flexibility in arrangement of the transmit antenna relative to the receive antenna; standard practice is to provide a system whose components can be used from any location within a certain range (an advantage of wireless systems over wired systems).

The present invention, on the other hand, uses a directional type antenna. By definition, a main lobe is the part of the directional antenna that transmits/receives the main beam; i.e., the radiation lobe containing the

direction of maximum radiation. A side lobe, also part of a directional antenna, is a lobe other than the main lobe which generally transmits/receives a signal at a ratio of amplitude from the main lobe. Thus, the wireless communications system disclosed in Fortune uses an omni directional antenna for both the transmit and receive antennas, whereas the transmitting/receiving system of the present invention uses directional antennas, each having at least a main lobe and a side lobe.

A reason that a directional type antenna is used in the present invention is because of the aspect of transmitting and receiving signal waves of the millimeter band indoors. These waves are at such a high frequency that they are typically transmitted and received in a line of sight using directional antennas. In the present invention, Appellants have determined that by transmitting a reflected signal wave using a main lobe and a line of sight signal wave using a side lobe that the receiver can be arranged to receive the propagated signals simultaneously. Because the present invention is for transmitting video signals, it is important to be able to receive duplicate signals simultaneously in order to avoid a ghosting effect which generally occurs when conventional wireless systems are used for such applications (see specification at page 8, lines 19-28). Ghosting occurs when a receiver receives the same transmitted signal at different times or when it receives different transmitted signals at the same time.

Also, the side lobe of the present transmit antenna transmits the millimeter band signal wave in a line of sight direction and the main lobe

transmits the millimeter signal wave in a direction such that it follows a reflected propagation path. Thus, the present invention makes use of reflection in order to obtain a redundant propagation path such that at least one propagated wave reaches the receiver. Fortune's technique takes into consideration reflection losses in determining total receiver power, but there is no indication that an indirect propagation path is required. In other words, Fortune does not consider reliability, per se, via redundant propagation paths. Thus it is clear that Fortune does not anticipate the present invention.

The rejection admits that Fortune doesn't teach transmission of a millimeter band signal. Instead, the rejection relies on the teachings of Hayashikura. As a reason for combining the references, the rejection states that, "It would have been obvious to one of ordinary skill in the art at the time the invention was made to comprise the indoor, in-building high frequency signal of Fortune et al with the millimeter band signal in order to fully utilize the continuous spectrum by broadening the intended use of the signal wave for commercial purposes merely by using an alternative frequency in a higher frequency band than usual depending on the available spectrum resource of the system." In other words, it appears that the rejection is stating that the millimeter band is merely an alternative frequency band. Appellants disagree.

Millimeter band frequencies suffer from a problem that if a path between a transmitter and receiver is obstructed by an object, propagation of a direct wave is interrupted as the wave is absorbed by the object (specification at page 1, first paragraph under "Description of the Background Art"). Thus, systems

based on millimeter band have not been practical for indoor applications (specification at page 1, second paragraph under "Description of the Background Art").

Hayashikura is directed to a vehicle-based system and thus does not address problems with in-door use. Because, of the inherent problems of using millimeter band signals in-doors, Appellants submit that use of a millimeter band signal in the system of Fortune would not just be a matter of using a signal of a higher frequency.

Also, Hayashikura does not disclose a plurality of propagation paths for a millimeter band signal, nor a receive antenna having a main lobe and a side lobe. Thus, Appellants submit that Hayashikura fails to make up for the deficiencies in Fortune.

Thus, Fortune and Hayashikura, either alone or in combination, fail to teach or suggest all claim limitations of claims 18, 23, 24, 30, 31, and 32.

The rejection treats the missing element itself as being obvious rather than the claimed invention as a whole. The rejection directs Appellants attention to a section at column 6, lines 52-56 of Fortune as teaching, as an obvious variation, a receive antenna having a main lobe and a side lobe. That section discloses that calculations using Fortune's technique can be made for other types of antennas (e.g., see column 6, lines 52-56, which states that, "Note that reflection path losses and direct path losses can be scaled for different types of antennas simply by multiplying the total calculation path loss by the antenna power gain in the direction of interest."). Appellants submit that

substituting the directional antenna of the present invention into the conventional wireless communications system of Fortune would not just be a matter of adjusting a power gain. Other factors would have to be taken into account. For example, substituting a directional antenna of the present invention for the assumed half-wave dipole of Fortune would restrict the communications system to stationary communications devices instead of portable devices. There is no evidence in Fortune that would teach use of its technique to take into consideration such a constraint.

Thus, Appellants submit that the transmitting/receiving system of the present claimed invention is not suggested by Fortune or Hayashikura, either alone or in combination.

Appellants submit that there is insufficient evidence to support that a receive antenna having a main lobe and a side lobe is necessarily present in Fortune. As noted above, Fortune merely discloses a half-wave dipole antenna as the antenna assumed in explaining its technique. Fortune states that its technique could be performed assuming other types of antennas (at column 6, lines 52-56). Hayashikura discloses a receiving antenna for picking up a reflected wave from an object. However, there is no evidence that would suggest a receive antenna having both a main lobe and a side lobe in order to enable reception of a signal through propagation paths except the line of sight propagation path at one of the lobes as well as through the line of sight propagation path.

Further with respect to claim 18, the claimed stationary receiver receives signals in either a normal state (unobstructed) or an obstructed state. Fortune's technique involves iterative calculations over potential positions for a transmitter point and a receiver point (see Figure 5) in a structure such as a building. Fortune's technique, however, does not take into account obstructions that occur during operation. In other words, for a given set of transmitter point and receiver point there would either be an obstruction or no obstruction, depending on the location of each position in the building. However, for one transmitting point and one receiving point pair, there can only be one of an obstructed path or an unobstructed path. Thus, Fortune fails to teach for a given stationary transmitter and a stationary receiver, a normal state when the line of sight propagation path is unobstructed and an obstructed state when the line of sight propagation path is obstructed.

For at least the above reasons, Appellants submit that the rejection fails to establish prima facie obviousness for claims 18, as well as 23, 24, 30, 31, and 32. Accordingly, Appellants respectfully request that the rejection be withdrawn.

C. Rejection of claims 12 and 13 under 35 U.S.C. 103(a)

1. <u>Argument Summary</u>

The reasoning provided in support of the rejection of claims 12 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiency of the

rejection is that Fortune fails to show or suggest all claim limitations recited in claims 12 and 13.

2. The rejection fails to establish prima facie obviousness of claims 12 and 13

Claim 12 is directed to a millimeter band signal transmitting/receiving system of claim 11, wherein each of a plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillation frequency for generating the signal wave at the same frequency (an example of the claimed arrangement is shown in Figure 5).

Claim 13 is directed to the millimeter band signal transmitting/receiving system of claim 12, wherein the local oscillators are in synchronization with each other.

Thus, the arguments in the above for claim 11, apply as well to claims 12 and 13.

As noted above, the Final Office Action relies on Fortune for teaching a plurality of stationary transmitters and stationary receiver of claim 11. Kagami is relied on for teaching the additional claimed elements recited in claims 12 and 13.

Kagami is directed to a digital radio-relay system having a transmitting terminal station and at least one repeater station (Abstract). Kagami discloses wherein the system includes a transmitting terminal station 320 having a pair of modulators 324-1 and 324-2 coupled with a pair of transmitters 322-1 and

322-2 (Figure 10). The transmitters 322-1 and 322-2 are supplied with a common reference frequency by a common oscillator 321, such that a horizontal polarized wave is transmitted in-phase with a vertical polarized wave (column 9, lines 42-47). Each transmitter has a phase lock oscillator, a frequency mixer and a high power amplifier. A non-regenerative repeater station 300 has an antenna 310 for receiving the H polarized wave and V polarized wave.

Appellants submit that Kagami fails to make up for the deficiency in Fortune of teaching a stationary receiver with a receive antenna having a main lobe and a side lobe arranged to simultaneously receive a plurality of millimeter band signal waves. Thus, at least for this reason, Appellants submit that the rejection fails to establish prima facie obviousness for claims 12 and 13. Accordingly, Appellants request that the rejection be withdrawn.

D. Rejection of claims 25 and 26 under 35 U.S.C. 103(a)

1. Argument Summary

The reasoning provided in support of the rejection of claims 25 and 26 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiency of the rejection is that Fortune fails to show or suggest all claim limitations recited in claims 25 and 26.

2. <u>The rejection fails to establish prima facie obviousness of claims 25 and 26</u>

Claim 25 is directed to a millimeter band signal transmitting/receiving system of claims 18 and 24, wherein each of a plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillation frequency for generating the signal wave at the same frequency (an example of the claimed arrangement is shown in Figure 5).

Claim 26 is directed to the millimeter band signal transmitting/receiving system of claim 25, wherein the local oscillators are in synchronization with each other.

Thus, the arguments in the above for claim 18, applies as well to claims 25 and 26.

As noted above, the Final Office Action relies on Fortune for teaching a plurality of stationary transmitters and stationary receiver of claim 11. Kagami is relied on for teaching the additional claimed elements recited in claims 25 and 26.

Kagami is directed to a digital radio-relay system having a transmitting terminal station and at least one repeater station (Abstract). Kagami discloses wherein the system includes a transmitting terminal station 320 having a pair of modulators 324-1 and 324-2 coupled with a pair of transmitters 322-1 and 322-2 (Figure 10). The transmitters 322-1 and 322-2 are supplied with a common reference frequency by a common oscillator 321, such that a horizontal polarized wave is transmitted in-phase with a vertical polarized wave (column 9, lines 42-47). Each transmitter has a phase lock oscillator, a

frequency mixer and a high power amplifier. A non-regenerative repeater station 300 has an antenna 310 for receiving the H polarized wave and V polarized wave.

Appellants submit that Kagami fails to make up for the deficiency in Fortune of teaching a stationary receiver with a receive antenna having a main lobe and a side lobe arranged to receive a millimeter signal from two associated transmit antennas by separate line of sight propagation paths. Thus, at least for this reason, Appellants submit that the rejection fails to establish prima facie obviousness for claims 25 and 26. Accordingly, Appellants request that the rejection be withdrawn.

E. Rejection of claims 2-7, 16, and 17 under 35 U.S.C. 103(a)

1. <u>Argument Summary</u>

The reasoning provided in support of the rejection of claims 2-7, 16, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiency of the rejection is that the rejection does not treat the obviousness of the claim as a whole.

Such a deficiency can be found with respect to claims 2-7, 16, and 17.

2. <u>The rejection fails to establish prima facie obviousness of claims 2-7, 16, and 17</u>

Claim 2, and similarly claims 3-7, 16, and 17, is directed to a millimeter band signal transmitting/receiving system comprising of claim 1 (15), wherein said propagation path forming portion includes a reflector arranged to reflect said signal wave transmitted from said transmitter and direct said reflected signal wave to said receiver.

The arguments in the above for claims 1 and 15 apply as well to claims 2-7, 16 and 17.

The Final Office Action states that Fortune's floor 216 constitutes the claimed reflector.

Fortune defines a model building for use in practicing its technique. Each surface in the building, such as wall 214, floor 216, and ceiling 218, is modeled as a multilayer dielectric (column 5, lines 3-5). The direct path 217 received power values are calculated using a standard free-space propagation formula (column 5, lines 50-51). The technique further takes into account reflection losses resulting from the reflection of electromagnetic energy incident upon a surface. The loses may be normalized such that a reflection loss of 1 signifies a perfect reflection where all of the incident electromagnetic energy incident upon the surface is reflected. A normalized reflection of zero signifies that none of the electromagnetic energy incident upon the surface is reflected. (column 6, lines 25-32). A total path loss for a given reflection path is computed using a normalized reflection loss (column 6, lines 39-42). Once the losses for all reflection path ways up to a specified number of reflections have been calculated, the total received power at the receiver point 212 is calculated

as the scalar sum of the received power values for the direct path and the reflection paths (column 6, lines 47-52).

When claim 2 is taken in the context of claim 1, from which it depends, the claim recites a reflector arranged to reflect a signal wave of an indirect propagation path such that the receive antenna simultaneously receives a plurality of millimeter band signal waves from a plurality of propagation paths including the indirect propagation path. Similar statements can be made with regard to other dependent claims 3-7, as well as claims 16 and 17 in the context of claim 15.

Though Fortune appears to take into account reflection losses over a plurality of reflected waves in computing a total received power, it does not appear to teach a reflector arranged to reflect a signal wave such that the receiver simultaneously receives a plurality of signal waves from a plurality of propagation paths including a direct propagation path and an indirect propagation path. Furthermore, in determining optimum RF coverage in the building such that received power at virtually all locations within the building exceeds a predetermined threshold, there is no indication in Fortune that the resulting position of the antenna 132 of the base station would be such that a receive antenna would simultaneously receive a plurality of signal waves from a plurality of propagation paths.

Thus, Appellants submit that Fortune fails to teach or suggest a reflector in the context claimed. Accordingly, Appellants respectfully request that the rejection be withdrawn.

F. Rejection of claims 19-22 under 35 U.S.C. 103(a)

1. Argument Summary

The reasoning provided in support of the rejection of claims 19-22 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiency of the rejection is that the rejection does not treat the obviousness of the claim as a whole.

Such a deficiency can be found with respect to claims 19-22.

2. The rejection fails to establish prima facie obviousness of claims 19-22

Claim 19, and similarly claims 20-22, is directed to a millimeter band signal transmitting/receiving system comprising of claim 18, wherein said propagation path forming portion includes a reflector arranged to reflect said signal wave transmitted from said transmitter and direct said reflected signal wave to said receiver.

The arguments in the above for claim 18 apply as well to claims 19-22.

The Final Office Action states that Fortune's floor 216 constitutes the claimed reflector.

Fortune defines a model building for use in practicing its technique. Each surface in the building, such as wall 214, floor 216, and ceiling 218, is modeled as a multilayer dielectric (column 5, lines 3-5). The direct path 217 received power values are calculated using a standard free-space propagation

formula (column 5, lines 50-51). The technique further takes into account reflection losses resulting from the reflection of electromagnetic energy incident upon a surface. The loses may be normalized such that a reflection loss of 1 signifies a perfect reflection where all of the incident electromagnetic energy incident upon the surface is reflected. A normalized reflection of zero signifies that none of the electromagnetic energy incident upon the surface is reflected. (column 6, lines 25-32). A total path loss for a given reflection path is computed using a normalized reflection loss (column 6, lines 39-42). Once the losses for all reflection path ways up to a specified number of reflections have been calculated, the total received power at the receiver point 212 is calculated as the scalar sum of the received power values for the direct path and the reflection paths (column 6, lines 47-52).

When claim 19 is taken in the context of claim 18, from which it depends, the claim recites a reflector arranged to reflect a signal wave of a propagation path except a line of sight propagation path such that the receive antenna receives a millimeter band signal through each of a plurality of propagation paths including the line of sight propagation path.

Though Fortune appears to take into account reflection losses over a plurality of reflected waves in computing a total received power, it does not appear to teach a reflector arranged to reflect a signal wave such that the receiver receives a signal wave from a plurality of propagation paths including a direct propagation path. Furthermore, in determining optimum RF coverage in the building such that received power at virtually all locations within the

building exceeds a predetermined threshold, there is no indication in Fortune that the resulting position of the antenna 132 of the base station would be such that a receive antenna would receive a signal wave from a plurality of propagation paths.

Thus, Appellants submit that Fortune fails to teach or suggest a reflector in the context claimed.

G. Rejection of claims 38-40 under 35 U.S.C. 103(a)

1. Argument Summary

The reasoning provided in support of the rejection of claims 38-40 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiency of the rejection is that Fortune and Hayashikura, either alone or in combination, fail to show or suggest all claim limitations.

2. The rejection fails to establish prima facie obviousness of claims 38-40

Claim 38 is directed to a millimeter band signal transmitting/receiving system as recited in claim 1 wherein the at least one indirect propagation path is formed in a main lobe of a transmit antenna.

The argument in the above for claim 1 applies as well to claims 38 and 39.

The final Office Action admits that Fortune and Hayashikura do not specifically disclose the at least one indirect propagation path formed in a main

lobe of a transmit antenna. Instead, the final Office Action appears to state that the claimed antenna main lobe would have been obvious to one of ordinary skill in the art at the time the invention was made.

In the present invention, Appellants have determined that by transmitting a reflected wave signal using a main lobe and a line of sight signal using a side lobe that the receiver can be arranged to receive the propagated signals simultaneously. Because the present invention is for transmitting video signals, it is important to be able to receive duplicate signals simultaneously in order to avoid a ghosting effect which generally occurs when conventional wireless systems are used for such applications (see specification at page 8, lines 19-28). Ghosting occurs when a receiver receives the same transmitted signal at different times or when it receives different transmitted signals at the same time. The technique in Fortune determines a suitable location of a base station antenna based on total received power at all receiver locations. There is no indication in Fortune that the technique takes into account prevention of ghosting in the case of video signal transmission.

Also, the side lobe of the present transmit antenna transmits the millimeter band signal wave in a line of sight direction and the main lobe transmits the millimeter wave signal in a direction such that it follows a reflected propagation path. Thus, the present invention makes use of reflection in order to obtain a redundant propagation path such that at least one propagated wave reaches the receiver.

Fortune's technique takes into account reflection losses in determining total received power. However, there is no indication that Fortune's technique would lead to a base station antenna positioned such that a main lobe transmits a signal wave as a reflected signal as well as the base station antenna transmitting a signal wave in a line of sight propagation path.

Claim 39 is directed to a millimeter band signal transmitting/receiving system of claim 1 wherein the line of sight propagation path is formed in a side lobe of a transmit antenna. Appellants have determined that by transmitting the line of sight propagation path from a side lobe of the transmit antenna that the receive antenna can be arranged to simultaneously receive signal waves from the plurality of propagation paths including the line of sight propagation path. Fortune's technique assumes an omni directional antenna. There is no indication in Fortune that in determining a position of the base station antenna based on a total received power that exceeds a predetermined value, that the base station would include an antenna having a side lobe and that the side lobe would be arranged to transmit a signal wave in a line of sight propagation path. Hayashikura fails to make up for this deficiency.

This same argument applies as well to claim 40, which depends from claim 15.

Thus, Appellants submit that Fortune and Hayashikura, either alone or in combination, fail to teach or suggest all claimed elements in claims 38-40. Appellants respectfully request that the rejection be withdrawn.

H. Rejection of claims 28 and 29 under 35 U.S.C. 103(a)

1. Argument Summary

The reasoning provided in support of the rejection of claims 28 and 29 under 35 U.S.C. § 103(a) as being unpatentable over Fortune and Hayashikura fails to establish prima facie obviousness. Generally, the deficiency of the rejection is that Fortune and Hayashikura, either alone or in combination, fail to show or suggest all claim limitations.

2. The rejection fails to establish prima facie obviousness of claims 28 and 29

Claim 29 is directed to a millimeter band signal transmitting/receiving system as recited in claim 18 wherein the at least one indirect propagation path is formed in a main lobe of a transmit antenna.

The argument in the above for claim 18 applies as well to claims 28 and 29.

The final Office Action admits that Fortune and Hayashikura do not specifically disclose the at least one indirect propagation path formed in a main lobe of a transmit antenna. Instead, the final Office Action appears to state that the claimed antenna main lobe would have been obvious to one of ordinary skill in the art at the time the invention was made.

In the present invention, Appellants have determined that by transmitting a reflected wave signal using a main lobe and a line of sight signal using a side lobe that the receiver can be arranged to receive the propagated signals simultaneously. Because the present invention is for transmitting video

signals, it is important to be able to receive duplicate signals simultaneously in order to avoid a ghosting effect which generally occurs when conventional wireless systems are used for such applications (see specification at page 8, lines 19-28). Ghosting occurs when a receiver receives the same transmitted signal at different times or when it receives different transmitted signals at the same time. The technique in Fortune determines a suitable location of a base station antenna based on total received power at all receiver locations. There is no indication in Fortune that the technique takes into account prevention of ghosting in the case of video signal transmission.

Also, the side lobe of the present transmit antenna transmits the millimeter band signal wave in a line of sight direction and the main lobe transmits the millimeter wave signal in a direction such that it follows a reflected propagation path. Thus, the present invention makes use of reflection in order to obtain a redundant propagation path such that at least one propagated wave reaches the receiver.

Fortune's technique takes into account reflection losses in determining total received power. However, there is no indication that Fortune's technique would lead to a base station antenna positioned such that a main lobe transmits a signal wave as a reflected signal as well as the base station antenna transmitting a signal wave in a line of sight propagation path.

Claim 28 is directed to the millimeter band signal transmitting/receiving system of claim 18, wherein the line of sight propagation path is formed in a side lobe of the transmit antenna. Fortune's technique is directed to

determining a position of the base station antenna based on a total received power that exceeds a predetermined value. Appellants submit that Fortune fails to teach or suggest that such a position would be based on using a side lobe of its transmit antenna to form a line of sight propagation path. Hayashikura fails to make up for this deficiency.

Thus, Appellants submit that Fortune and Hayashikura, either alone or in combination, fail to teach or suggest all claimed elements in claims 28 and 29. Appellants respectfully request that the rejection be withdrawn.

I. Rejection of claim 27 under 35 U.S.C. 103(a)

1. Argument Summary

The reasoning provided in support of the rejection of claim 27 under 35 U.S.C. § 103(a) as being unpatentable over Fortune, Hayashikura, and Evans fails to establish prima facie obviousness. Generally, the deficiency of the rejection is that the rejection does not treat the obviousness of the claim as a whole.

Such a deficiency can be found with respect to claim 27.

2. The rejection fails to establish prima facie obviousness of claim 27

Claim 27 is directed to a millimeter band signal transmitting/receiving system as recited in claim 18 wherein the signal is a video signal.

The argument in the above for claim 18 applies as well to claim 27.

The final Office Action admits that neither Fortune nor Hayashikura disclose a video signal. Instead, the final Office Action relies on Evans for teaching a video signal.

Appellants submit that claim 27 is directed to more than just a particular type of signal. Appellants submit that the rejection fails to treat the obviousness of the claim as a whole.

Claim 27 is directed to, among other things, at least one stationary transmitter transmitting a millimeter band video signal through an associated transmit antenna along a plurality of propagation paths of said millimeter band signal formed by said associated transmit antenna including a line of sight propagation path between said associated transmit antenna and a receive antenna; a stationary receiver receiving the millimeter band video signal through said receive antenna having a main lobe and a side lobe.

Evans is directed to a cellular video distribution system. Some of the disclosed embodiments include omni directional transmitters (Figures 1-5 and 7). However, Evans discloses that such disclosed embodiments can be subject to fading, interference and/or blocking of the transmitted signal (with respect to Figure 6: column 8, lines 9-12, as well as the paragraph at lines 13-47). For example, a subscribing receiver (R30) may be subject to multi-path propagation causing severe signal fading. In order to reduce or avoid such problems, Evans states that the omni directional transmitters can be replaced with directional transmitters carefully sited at nodes around the periphery of respective cells, i.e., edge-fed instead of center-fed (with respect to Figure 9, column 8, lines 48-

55). The subscribing receiver is disclosed as being for restoring signal information (column 5, lines 53-55) and includes a capability to feed back information to the transmitter (column 4, lines 57-64; column 6; column 8, lines 25-29).

Evans discloses that reflections from buildings, ground, etc. lead to poor signal reception (column 8, lines 13-23). To solve this problem Evans discloses use of directional transmitters. Thus, Appellants submit that Evans does not make up for the deficiency in Fortune and Hayashikura, of failing to teach or suggest at least a receiver receiving the millimeter band signal through a receive antenna having a main lobe and a side lobe.

Accordingly, Appellants submit that the rejection fails to establish prima facie obviousness for claim 27 as a whole. Appellants request that the rejection be withdrawn.

X. CONCLUSION

For the reasons specifically set forth above, the outstanding rejections set forth in the Final Office Action should be reversed.

Respectfully submitted,

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APPENDIX OF CLAIMS

1. (Previously Presented) A millimeter band signal transmitting/receiving system, comprising:

a stationary transmitter transmitting a millimeter band signal wave;

a propagation path forming portion forming at least one indirect propagation path for propagation of said millimeter band signal wave; and

a stationary receiver including a receive antenna having a main lobe and a side lobe capable of simultaneously receiving a plurality of said millimeter band signal waves from a plurality of propagation paths including a line of sight propagation path to said transmitter and said at least one indirect propagation path, and receiving said millimeter band signal wave from at least one of said plurality of propagation paths.

2. (Original) The millimeter band signal transmitting/receiving system according to claim 1, wherein said propagation path forming portion includes a reflector arranged to reflect said signal wave transmitted from said transmitter and direct said reflected signal wave to said receiver.

3. (Previously Presented) The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector is arranged substantially in parallel to a line of sight between said transmitter and said receiver.

4. (Original) The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a thin film including aluminum.

5. (Previously Presented) The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a surface covered by an insulating material.

6. (Previously Presented) The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a surface covered by a transparent insulating material.

7. (Original) The millimeter band signal transmitting/receiving system according to claim 2, wherein a plurality of said reflectors are arranged to form said plurality of propagation paths for propagating said signal waves to said receiver.

8. (Original) The millimeter band signal transmitting/receiving system according to claim 1, wherein said receiver always simultaneously receives said plurality of signal waves from said plurality of propagation paths in a normal state.

9. (Previously Presented) The millimeter band signal transmitting/receiving system according to claim 1, wherein said receiver and said transmitter are provided inside a house,

said propagation path includes a structural component defining an internal space of said house and reflecting a signal wave transmitted from said transmitter, and

said transmitter is spaced by a prescribed distance from said structural component defining said internal space of said house for transmitting said signal wave at a prescribed transmission angle.

10. (Previously Presented) The millimeter band signal transmitting/receiving system according to claim 9, wherein each of said prescribed distance and said prescribed transmission angle is determined depending on a region for propagation of said plurality of signal waves and a positional relationship between said transmitter and said receiver.

11. (Previously Presented) A millimeter band signal transmitting/receiving system, comprising:

a plurality of stationary transmitters; and

a stationary receiver including a receive antenna having a main lobe and a side lobe arranged to simultaneously receive a plurality of millimeter band signal waves output from said plurality of transmitters,

said plurality of millimeter band signal waves being transmitted from said plurality of transmitters having a same frequency.

12. (Original) The millimeter band signal transmitting/receiving system according to claim 11, wherein each of said plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillator frequency for generating said signal wave at said same frequency.

13. (Original) The millimeter band signal transmitting/receiving system according to claim 12, wherein said local oscillators are in synchronization with each other.

14. (Original) The millimeter band signal transmitting/receiving system according to claim 11, wherein said receiver always simultaneously receives said plurality of signal waves in a normal state.

15. (Previously Presented) A house provided with a millimeter band signal transmitting/receiving system including a structural component defining an internal space and a millimeter band signal transmitting/receiving system, wherein said millimeter band signal transmitting/receiving system comprises:

a stationary transmitter transmitting a millimeter band signal wave;

a propagation path forming portion arranged in said structural component for forming at least one indirect propagation path for propagation of said millimeter band signal wave; and

a stationary receiver including a receive antenna having a main lobe and a side lobe simultaneously receiving a plurality of millimeter band signal waves through a plurality of propagation paths including a line of sight propagation path to said transmitter and said at least one indirect propagation path.

16. (Original) The house provided with the millimeter band signal transmitting/receiving system according to claim 15, wherein said propagation path forming portion has a reflector reflecting an output from said transmitter and said reflector is arranged on a surface of said component.

17. (Original) The house provided with the millimeter band signal transmitting/receiving system according to claim 15, wherein said propagation path forming portion has a reflector reflecting an output from said transmitter and said reflector is arranged inside said component.

18. (Previously Presented) A millimeter band signal transmitting/receiving system, comprising:

at least one stationary transmitter transmitting a millimeter band signal through an associated transmit antenna along a plurality of propagation paths of said millimeter band signal formed by said associated transmit antenna

including a line of sight propagation path between said associated transmit antenna and a receive antenna;

a stationary receiver receiving the millimeter band signal through said receive antenna having a main lobe and a side lobe,

wherein, in a normal state when said line of sight propagation path is unobstructed, said receiver receives the millimeter band signal through each of the plurality of propagation paths including said line of sight propagation path, and

wherein, in an obstructed state when said line of sight propagation path is obstructed, said receiver receives the millimeter band signal through each of the plurality of propagation paths except said line of sight propagation path.

19. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein at least a portion of said plurality of propagation paths are formed by at least one reflector.

20. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 19, wherein said at least one reflector has a surface arranged substantially parallel to said line of sight propagation path.

21. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 19, wherein said at least one reflector includes two reflectors.

22. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 21, wherein at least one of said plurality of propagation paths of said signal is formed by reflection from each of said two reflectors.

23. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said at least one transmitter is a single transmitter.

24. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said at least one transmitter includes two transmitters and two associated transmit antennas,

wherein each of said two associated transmit antennas provides a separate line of sight propagation path to said receive antenna.

25. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 24, wherein said two transmitters are synchronized with each other.

26. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 25, wherein said two transmitters share a common local oscillator.

27. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said signal is a video signal.

28. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said line of sight propagation path between said associated transmit antenna and the receive antenna is formed in a side lobe of said associated transmit antenna.

29. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said plurality of propagation paths of said signal except said line of sight propagation path are formed in a main lobe of said associated transmit antenna.

30. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein a portion of said plurality of propagation paths are formed by interaction with a structural component of a building.

31. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said receive antenna is a single receive antenna.

32. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 18, wherein said receiver simultaneously receives the signal through each of an unobstructed plurality of propagation paths.

33. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 1, wherein said receiver receives said signal wave through said line of sight propagation path when said line of sight propagation path is not blocked.

34. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 1, wherein said receiver receives said signal wave only through said at least one indirect path when said line of sight propagation path is blocked.

35. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 11, wherein said receiver receives one of said plurality of signal waves through at least one line of sight propagation path between at least one of said plurality of transmitters and said receiver.

36. (Previously Presented) The house provided with a millimeter band signal transmitting/receiving system of claim 15, wherein said receiver receives

one of said plurality of signal waves through said line of sight propagation path when said line of sight propagation path is not blocked.

37. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 15, wherein said receiver only receives said plurality of signal waves through said at least one indirect propagation path when said line of sight propagation path is blocked.

38. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 1, wherein said at least one indirect propagation path is formed in a main lobe of a transmit antenna.

39. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 1, wherein said line of sight propagation path is formed in a side lobe of a transmit antenna.

40. (Previously Presented) The millimeter band signal transmitting/receiving system of claim 15, wherein said line of sight propagation path is formed in a side lobe of a transmit antenna.